WHAT IS CLAIMED IS:

1. An image data compressing method for compressing image data having a multiple value, comprising the steps of:

separating the image data into modified data and position data, the modified data being produced by modifying a selected color of an image portion by a different color that is determined arbitrarily, and the position data indicating a position where the image portion of the selected color is present; and

compressing the modified data and the position data separately.

2. An image data compressing method for compressing image data having a multiple value, comprising the steps of:

separating the image data into remaining data and position data, the remaining data being produced by eliminating data having an arbitrarily selected color image portion from the image data, and the position data indicating a position where the selected color image portion is present; and

compressing the remaining data and the position data separately.

3. An image data compressing apparatus for compressing image data having a multiple value, comprising:

color selecting means for selecting an arbitrary color from the image data;

data separating means for separating the image data

into modified data and position data, the modified data being produced by modifying a color of an image portion selected by the color selecting means by a color surrounding the image portion, and the position data indicating a position where the color image portion selected by the color selecting means is present; and

data compressing means for compressing the modified data and the position data separately.

4. An image data compressing apparatus for compressing image data having a multiple value, comprising:

color selecting means for selecting an arbitrary color from the image data;

data separating means for separating the image data into modified data and position data, the modified data being produced by eliminating a color of an image portion selected by the color selecting means from the image data, and the position data indicating a position where the color image portion selected by the color selecting means is present; and

data compressing means for compressing the remaining data and the position data separately.

5. The image data compressing apparatus as in claim 3 or 4, wherein:

the color selecting means selects a color which increases a spatial frequency of the image.

6. The image data compressing apparatus as in claim 3 or 4, wherein:

the color selecting means selects a color which are relatively used frequently within the image data.

7. The image data compressing apparatus as in claim 5, wherein:

the color selecting means selects a road color contained in a map as a color which increases the spatial frequency, when the image data corresponds to the map.

8. The image data compressing apparatus as in claim 6, wherein:

the color selecting means selects a background color contained in a map as a color which is relatively used frequently within the image data, when the image data corresponds to the map.

9. The image data compressing apparatus as in claim 3 or 4, wherein:

the color selecting means selects a color which is instructed from an external device for executing a predetermined application software process operation by using the image data.

10. The image data compressing apparatus as in claim 5, wherein:

the color selecting means detects the color which

increases the spatial frequency by employing the image data, and selects the detected color.

11. The image data compressing apparatus as in claim 6, wherein:

the color selecting means detects a color which is relatively used frequently within the image data, and selects the detected color.

12. The image data compressing apparatus as in claim 3 or 4, wherein:

the color selecting means selects a plurality of colors; and

the position data is set by 1 bit for each of the plurality of colors.

13. The image data compressing apparatus as in claim 3 or 4, wherein:

the color selecting means is capable of selecting a plurality of colors; and

the position data is set so that $(2^n-1)$ pieces of colors are indicated by n bits.

14. The image data compressing apparatus as in claim 3 or 4, wherein:

the data compressing means has a single data compressing means to realize data compressing operations by

sequentially compressing both the position data and either the modified data or the remaining data.

15. The image data compressing apparatus as in claim 3 or 4, wherein the data compressing means includes:

data converting means for converting the image data to reduce entropy;

coding means for allocating a variable length code to the data converted by the data converting means; and

coding amount control means for controlling a data amount of image data coded by the coding means,

wherein the data converting means executes a converting process operation by way of a 2-value run-length conversion with respect to the position data, and also executes a converting process operation by way of a multi-value run-length conversion with respect to the modified data or the remaining data.

16. The image data compressing apparatus as in claim 3 or 4, wherein the data compressing means includes:

data converting means for converting the image data to reduce entropy;

coding means for allocating a variable length code to the data converted by the data converting means; and

coding amount control means for controlling a data amount of image data coded by the coding means,

the data converting means executes a converting

process operation by way of a 2-value run-length conversion with respect to the position data, and also executes a converting process operation by way of the 2-value run-length conversion with respect to the modified data or the remaining data in such a manner that either the modified data or the remaining data is resolved into a plurality of bit planes, and the data of each of the bit planes are sequentially converted by the 2-value run-length conversion either serially or in parallel.

17. The image data compressing apparatus as in claim 16, wherein:

the coding amount control means compresses either the modified data or the remaining data in a lossy manner, and executes the data compressing process operation in a relatively high compression ratio.

18. The image data compressing apparatus as in claim 16, wherein:

the coding amount control means controls the coding amount in such a manner that a lossy data compressing process operation is carried out by sequentially cutting off the bit planes from such a bit plane having a low order with respect to the coding amount which is produced by coding either the modified data or the remaining data by the coding means.

19. The image data compressing apparatus as in claim 16, wherein:

the data converting means executes a DCT process operation with respect to either the modified data or the remaining data, instead of the run-length conversion.

20. The image data compressing apparatus as in claim 11, wherein:

the coding means executes the variable coding process operation by way of Huffman coding operation.

21. The image data compressing method as in claim 2, wherein the separating step includes:

separating the image data into position data, remaining data and all-position data, the position data is constituted only by the selected color, the remaining data being produced by extracting data of arbitrarily selected plural color image portions from the image data, and the all-position data indicating positions where all of the selected color image portions are present; and

separating sequentially the position data into position data and an image in an order of predetermined selected colors, the selected colors being located in the position data, and the image being produced by extracting the selected colors; and

compressing the remaining data, the all-position data and the position data of each of the selected colors separately.

22. The image data compressing method as in claim 2, further comprising the steps of:

determining to any one of a first compressing manner and a second compressing manner based upon an image feature of the image data to compress the image data by employing the determined compressing manner,

wherein the first compressing manner is defined by a step in which the image data is separated into the position data, the remaining data and the all-position data, the position data is constituted only by the selected color, the remaining data is produced by extracting data of arbitrarily selected plural color image portions from the image data, and the all-position data indicates a position where all of the selected color image portions are present,

wherein the first compressing method is also defined by a step in which the position data is sequentially separated into position data and an image in an order of predetermined selected colors, the selected colors are located in the position data, and the image is produced by extracting the selected colors,

wherein the remaining data, the all-position data, and the position data of each of the selected colors are compressed separately,

wherein the second compressing manner is defined by a step in which the image data is separated into position data and remaining data, the remaining data is being produced by extracting data of one color portion among arbitrarily selected

plural color image portions from the image data, and the position data indicating a position where the selected one color image portion is present, and further the remaining data is similarly separated into the remaining data and the position data, and

wherein the second compressing manner is carried out plural times equal to a total number of the plural colors.

23. The image data compressing apparatus as in claim 4, wherein the data separating means includes:

first data separating means for separating the image data into the position data, the remaining data and the all-selected color position data, the position data being constituted only by the selected color, the remaining data being produced by extracting data of plural color image portions selected by the color selecting means from the image data, and the all-selected color position data indicating a position where all of the selected color image portions are present; and

second data separating means operated in such a manner that the position data separated by the first data separating means is sequentially separated into position data and an image in an order of predetermined selected colors, the selected colors being located in the position data, and the image being produced by extracting the selected colors,

wherein the data compressing means separately compress both the remaining data and the all-position data which are separated by the first data separating means and the position data of the respective selected colors separated by the second

data separating means.

24. The image data compressing apparatus as in claim 23, further comprising:

third data separating means operated in such a manner that the image data is separated into position data and remaining data, the remaining data being produced by extracting data of one color portion among arbitrarily selected plural color image portions from the image data, the all-position data indicating a position where the selected one color image portion is present, the remaining data being similarly separated into the remaining data and the position data, and the second compressing manner being carried out plural times equal to a total number of the plural colors;

second data compressing means for separately compressing the final remaining data separated by the third data separating means, and the position data obtained in the respective separating process operations; and

compressing manner determining means for determining any one of a first compressing manner and a second compressing manner based upon an image feature of the image data, the first compressing manner being realized by employing the color selecting means, the first data separating means, the second data separating means and the first data compressing means, and the second compressing manner being realized by using the color selecting means, the third data separating means and the second data compressing means,

wherein the image data is compressed by using the compressing manner determined by the compressing manner determining means.

25. The image data compressing apparatus as in claim 24, wherein:

the compressing manner determining means determines the compressing manner based upon a ratio of the remaining data to the entire image data, the remaining data being equal to data of the color image portion which is not selected by the color selecting means.

26. The image data compressing apparatus as in claim 23, wherein:

the image data compressing means further includes priority order determining means for determining priority orders of the plurality of selected colors; and

the second data separating means sequentially separates the image data into the position data of the selected color and the extracted image of the selected color in the order of the high priority degree determined by the priority order determining means.

27. The image data compressing apparatus as in claim 26, wherein:

the data compressing means does not compress such position data having the lowest priority degree among the data

separated by the second data separating means.

28. The image data compressing apparatus as in claim 23, wherein:

the color selecting means selects a color based upon a used amount among the image data.

29. The image data compressing apparatus as in claim 28, wherein:

the color selecting means selects a color which is instructed from an external device for executing a predetermined application software process operation by using the image data.

30. The image data compressing apparatus as in claim 28, wherein:

the color selecting means detects a color which is relatively used many time within the image data and selects the detected color.

31. The image data compressing apparatus as in claim 24, wherein:

the color selecting means selects a color based upon a used amount among the image data.

32. The image data compressing apparatus as in claim 31, wherein:

the priority degree determining means determines the

priority degree in response to an instruction issued from an external device for executing a predetermined application software operation by using the image data.

33. The image data compressing apparatus as in claim 31, wherein:

the priority degree determining means detects a use amount of a color contained in the image data and determines a higher priority degree when the detected color use amount is large.

34. The image data compressing apparatus as in claim 23, wherein:

the data compressing means has means for compressing the respective separated data in parallel.

35. The image data compressing apparatus as in claim 23, wherein:

the data compressing means includes data converting means for converting the image data so as to reduce entropy, coding means for allocating a variable length code to the data converted by the data converting means, and coding amount control means for controlling a data amount of image data coded by the coding means; and

the data converting means executes a converting process operation by way of a 2-value run-length conversion with respect to the position data of each of the selected colors, or

the all-position data, and also executes a converting process operation by way of a multi-value run-length conversion with respect to the remaining data.

36. The image data compressing apparatus as in claim 23, wherein:

the data compressing means includes data converting means for converting the image data so as to reduce entropy, coding means for allocating a variable length code to the data converted by the data converting means, and coding amount control means for controlling a data amount of image data coded by the coding means; and

the data converting means executes a converting process operation by way of a 2-value run-length conversion with respect to the position data of each of the selected colors, or the all-position data, and also executes a converting process operation by way of the 2-value run-length conversion with respect to the remaining data in such a manner that the remaining data is solved into a plurality of bit planes, and the data of each of the bit planes are sequentially converted by the 2-value run-length conversion in either a serial manner or a parallel manner.

37. The image data compressing apparatus as in claim 35, wherein:

the data converting means outputs a maximum value, and thereafter adds such a code whose run-length is equal to "0" in

a case that the run-length equal to the output from the run-length conversion exceeds the maximum value in the run-length process operation.

38. The image data compressing apparatus as in claim 35, wherein:

the image data compressing means includes priority order determining means for determining priority orders of the plurality of selected colors; and

the second data separating means sequentially separates the image data into the position data of the selected color and the extracted image of the selected color in the order of the high priority degree determined by the priority order determining means; and

the priority degree determining means calculates a continuous degree of colors contained in the image data along the process direction, and sets a higher priority degree of such a color having a higher continuous degree.

39. The image data compressing apparatus as in claim 23, wherein:

the data compressing means produces a code which indicates that the all-position data and the remaining data separated by the first separating means or the position data of each selected color separated by the second data separating means are the same in all process operations.

40. A computer readable recording medium for recording thereon a computer program capable of causing a computer system to function as the respective means employed in the image data compressing apparatus as recited in claim 3 or 4.

41. An image data compressing apparatus comprising:

data converting means for solving image data having a multiple value, which is expressed by a color palette system, into bit planes, and also for sequentially executing a 2-value run-length converting process operation with respect to the data of each of the bit planes;

coding means for allocating a code to the data converted by the data converting means; and

reconstructing means for reconstructing the color palette prior to a data converting operation by the data converting means in such a manner that indexes of pixels are approximated to be close to each other, and the pixels are continued in a data processing sequence within the image data.

42. The image data compressing apparatus as in claim 41, wherein:

the reconstructing means allocates the indexes so that the number of planes which have same values between data of corresponding planes relatively increases with respect to the indexes which are approximated to be close in a reconstructing operation.

43. The image data compressing apparatus as in claim 41, wherein:

the reconstructing means reconstructs the color palette in such a manner that color indexes of the color palette used in the image data are continued, and indexes of pixels continued in the image data have close values each other.

44. The image data compressing apparatus as in claim 41, wherein:

the reconstructing means sequentially allocates the color indexes of the color palette in correspondence with a sequence of colors whose amounts of use are large within the image data.

45. The image data compressing apparatus as in claim 41, wherein:

the reconstructing means determines a pair of two colors by employing a determining method that among data located preceding to and following a color of interest, the largest amount of such a color other than the color of interest is used as an index of a color located preceding to and following the color of interest, determines a pair of such colors which have not yet determined in a recursive manner based upon the determining method, and then arranges the color palette every paired color.

46. The image data compressing apparatus as in claim 45,

wherein:

the reconstructing means sets that a first color of interest is selected to be a color which is relatively used many times within the image data.

47. The image data compressing apparatus as in claim 46, wherein:

the image reconstructing means determines the respective pairs and thereafter sets such a color which is used many times within the pair as a representative color, and sequentially allocates the indexes in an order from a representative color which is relatively most frequently used among the image data.

48. The image data compressing apparatus as in claim 41, wherein:

the reconstructing means reconstructs the color palette in such a manner that indexes of the plural colors for forming a half-tone color are continued, in a case that the image data represents the half-tone color by employing a plurality of colors.

49. The image data compressing apparatus as in claim 41, wherein:

the reconstructing means makes close to each other indexes of colors which are employed in a specific element among elements which constitute the map image, when the image data

corresponds to a map image.

50. The image data compressing apparatus as in claim 49, wherein:

the specific element corresponds to a landmark indicated on the map image.

51. The image data compressing apparatus as in claim 50, wherein:

the reconstructing means arranges colors in such a manner that a color other than the commonly-used color which is used in one of the two landmarks is continued to a preceding index of the commonly-used color, in the case that there is such a color commonly used in two landmarks; and

the reconstructing means arranges colors in such a manner that a color other than the commonly-used color which is used in another landmark is continued to a succeeding index of the commonly-used color.

52. The image data compressing apparatus as in claim 49, wherein:

the specific element corresponds to a background and a road.

53. The image data compressing apparatus as in claim 52, wherein:

the reconstructing means sequentially arranges colors

in an index close to a background color from a color of the road which is used many times within the image data.

54. The image data compressing apparatus as in claim 49, wherein:

the specific element corresponds to a background and a symbol.

55. The image data compressing apparatus as in claim 54, wherein:

the reconstructing means sequentially arranges colors in an index close to a background color from a color of the symbol which is used many times within the map image.

56. The image data compressing apparatus as in claim 49, wherein:

the reconstructing means sequentially arranges colors in an index close to a background color from a color of either the symbol or the road which is used many times within the map image.

57. The image data compressing apparatus as in claim 41, wherein:

the coding means allocates a variable length code to the data converted by the data converting means.

58. A computer readable recording medium for recording thereon:

a computer program capable of causing a computer system to function as the data converting means, the coding means, and the reconstructing means of the image data compressing apparatus as recited in claim 41.

59. The image data compressing method as in claim 1, wherein:

the different color is determined to be a color surrounding the image portion.

60. The image data compressing apparatus as in claim 3 or 4, further comprising:

means for variably switching the arbitrary color to be selected by the color selecting means.